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CURRENT LITERATURE

BOOK REVIEWS

Hydrogen ion determination

Hydrogen ion determinations are of ever increasing interest and importance to investigators in physiological and other fields of botany. Two methods of making such determinations are more or less widely known and well standardized: the electrometric and colorimetric methods. Both the history of the development and accounts of the practical operation of making such determinations have heretofore existed in scattered periodicals, and a student desiring to follow one of the methods had the choice of searching through several periodicals for the necessary information or of consulting such works as MICHAELIS.¹ A book by CLARK² has recently appeared which will be welcomed by students of hydrogen ion concentration, both on account of its detailed information and authoritative nature, written as it is by one who has made many contributions toward the development of methods for measurements of this sort. Chapter i deals with "General relations among acids and bases"; then follow 59 pages on the colorimetric determination of hydrogen ion, 108 pages on electrometric measurements, a short chapter of 5 pages on "Supplementary methods," and lastly a chapter of 29 pages on "Applications." The book also includes a very complete bibliography and an appendix containing tables for converting P_H to hydrogen ion concentration, other tables applicable to P_H measurements, and a list of representative potentiometer equipment.

Under "General relations among acids and bases" the author discusses the theory of dissociation in solution, and develops the related equations. The following 59 pages on colorimetric determinations include a chapter on the general method, two chapters on the theory and choice of indicators, another chapter devoted to buffer solutions, and two chapters concerning errors of the method and practical determinations with indicators. The author includes tables showing Sorensen's indicators, Clark and Lubs series, and Gillespie's drop-ratio series, giving their P_H ranges and other data necessary in using them. The section dealing with electrometric measurements is divided into ten chapters. They include a short outline of the method, the theory of the hydrogen electrode, discussion and illustration of various types of electrode vessels, potentiometers and other electrical apparatus, hydrogen generators

¹ MICHAELIS, LEONOR, *Die Wasserstoffionenkonzentration*. Berlin: Julius Springer Co. 1914.

² CLARK, W. MANSFIELD, *The determination of hydrogen ions*. pp. 317. Baltimore: Williams & Wilkins Co. 1920.

and temperature control, discussion of reduction potential and its relation to hydrogen electrode potential, sources of error, standard solutions for checking such measurements, and a chapter on P_H standardization, the last including a "Proposal of standard values." The chapter on "Supplementary methods" deals with the conductivity and other methods which have been used in special cases in estimating hydrogen ion concentrations. The final chapter on "Applications" groups the literature according to subject matter, and according to the author constitutes an index to the bibliography which follows.

The reviewer was especially interested in the details which the writer has added from his experience in the manipulation of apparatus. Among these are the charging of storage batteries using an ordinary electric light current, the effects of various substances (carbon dioxide, phenol, toluol, oxygen, etc.) in solution upon the hydrogen electrode, purification of mercury, construction of a constant temperature box, and lists and discussion of possible potentiometer equipment. For the student already engaged in making hydrogen ion determinations the book contains many valuable suggestions, and forms a ready reference to literature, while to the student who contemplates making such measurements it represents a manual, an outline of procedure.—J. M. ARTHUR.

A chemistry of plant products

HAAS and HILL'S, *An introduction to the chemistry of plant products*, which first appeared in 1913 and was reviewed in this journal,³ has now reached a second edition.⁴ From its first appearance it has been recognized as a book filling a long felt want. It was intended to supply the botanist, and especially the plant physiologist, with chemical knowledge and methods not found in the ordinary textbooks on chemistry. It has filled its purpose admirably. Although written primarily for the plant physiologist, the avoidance of a technical method of treatment makes it a useful book for the botanist of limited chemical training, who is working on problems involving a knowledge of plant materials. Thus at the present time, when the synthetic viewpoint of botany in relation to the other sciences is coming to the front, when it is coming to be recognized that botany and chemistry must unite forces in solving many problems, the method of treatment used in the book has increased significance. It is a significant commentary on the amount of work being done by WILL-STÄTTER and his coworkers, and by others no doubt inspired by them, that the major changes in the book have been made in the chapter on pigments. This chapter has been entirely rewritten and much new material incorporated, especially in the part dealing with chlorophyll. A few other important additions have been made to the text, and a number of references have been added

³ BOT. GAZ. 56:343. 1913.

⁴ HAAS, PAUL, and HILL, T. G., *An introduction to the chemistry of plant products*. 2d ed. pp. xii+411. London: Longmans, Green. 1917.